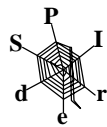


# Increase ICT Project Success with Concrete Scope Management



Bachelor of SPI - 20.11.2007

Estimation  
Benchmarking  
Quality management  
Process improvement

Carol Dekkers & Pekka Forselius, 4SUM Partners  
[www.4sumpartners.com](http://www.4sumpartners.com)



## Agenda

1. ICT projects are unique
2. Scope management concepts
3. Northern and Southern SCOPE
4. Scope managers
5. Making change happen
6. Summary

Estimation  
Benchmarking  
Quality management  
Process improvement

Carol Dekkers & Pekka Forselius, 4SUM Partners  
[www.4sumpartners.com](http://www.4sumpartners.com)



# 1. Information and Communication Technology (ICT) projects are unique



## Definition of an ICT project

A temporary endeavor  
undertaken to create  
an unique ICT (software)  
product or service

# Engineering and ICT projects

	Engineering	ICT
Industry	Mature	Relatively young
Product	Tangible (road, building)	Intangible (software)
Cost model	Standard (USD/km or /m <sup>2</sup> )	? (USD/SLOC?)
Metrics	Common (m <sup>2</sup> )	Users/developers → differ
“Project” definition	Discrete: Construction, renovation, upgrade → 1 building at a time	Hybrid mixture: R&D, development, conversion, enhancement → many s/w
Stability & costs	Some renovations, initial capital cost > maintenance	Frequent enhancement, maintenance = 8x develop
Controls, models	Building codes, “sealed” engineering blueprints	Regulatory (e.g., U.S. FDA), CMM®/CMMI®, SPICE

# ICT project uniqueness

- 1 in 3 projects → Success
- Young industry → Lack of tools, unit costs, lack of historical data and experience
- Intangible product → Difficult to measure
- Hybrid ‘projects’ → PM challenge
- Risks high → materials, intangible product, requirement completeness & stability

# Scope related reasons for ICT project failure

Lack of top management commitment

**Misunderstanding the requirements**

**Not managing change properly**

**Failure to gain user commitment**

Lack of effective project management skills

Lack of adequate user involvement

**Failure to manage end user expectations**

Lack of effective project management methodology

**Unclear/misunderstood scope/objectives**

**Changing scope/objectives**

# ICT project breakthroughs

- Australia → Southern SCOPE
- Finland → Northern SCOPE
- Universal applicability
- Based on concrete scope management
- Modeled on PMBOK principles: Initiate, plan, execute, control, close

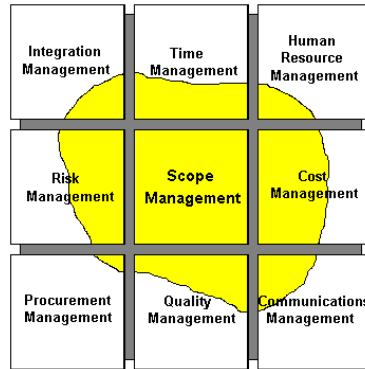
## 2. Scope management concepts



## Enhanced scope management

1. Initialize & scope
2. Split into manageable sub-projects (as necessary)
3. Quantify & cost (based on currency per unit size)
4. Manage, track, control, and deliver based on 1-3. Change management based on scope and quantification by unit size

# FiSMA scope management concept

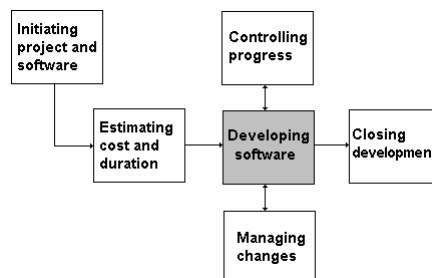


Estimation  
Benchmarking  
Quality management  
Process improvement

Carol Dekkers & Pekka Forselius, 4SUM Partners  
[www.4sumpartners.com](http://www.4sumpartners.com)



# FiSMA scope management concept



Estimation  
Benchmarking  
Quality management  
Process improvement

Carol Dekkers & Pekka Forselius, 4SUM Partners  
[www.4sumpartners.com](http://www.4sumpartners.com)



### 3. Northern and Southern SCOPE

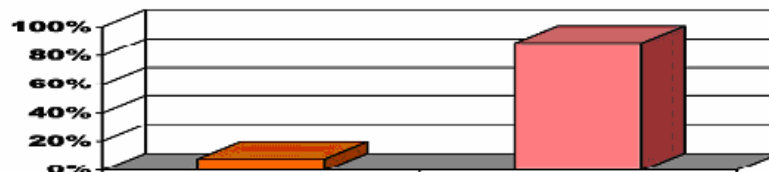


Estimation  
Benchmarking  
Quality management  
Process improvement

Carol Dekkers & Pekka Forselius, 4SUM Partners  
[www.4sumpartners.com](http://www.4sumpartners.com)



### Southern SCOPE



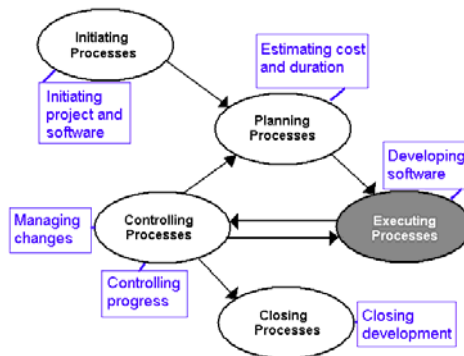
The cost overruns for projects using the southernSCOPE method was found to be less than 10% whereas the industry norm was 84%. (ISBSG, 2005)

Estimation  
Benchmarking  
Quality management  
Process improvement

Carol Dekkers & Pekka Forselius, 4SUM Partners  
[www.4sumpartners.com](http://www.4sumpartners.com)



# Northern SCOPE



## Northern SCOPE Types of ICT projects

1. CUSTomer specific new development project
2. Software PRODuct new development project
3. Software VERSion enhancement project
4. ICT SERVice development project
5. PACKage software configuration project
6. Data CONVersion project
7. Software INTeGration development project



## Rules for splitting a project into sub-projects

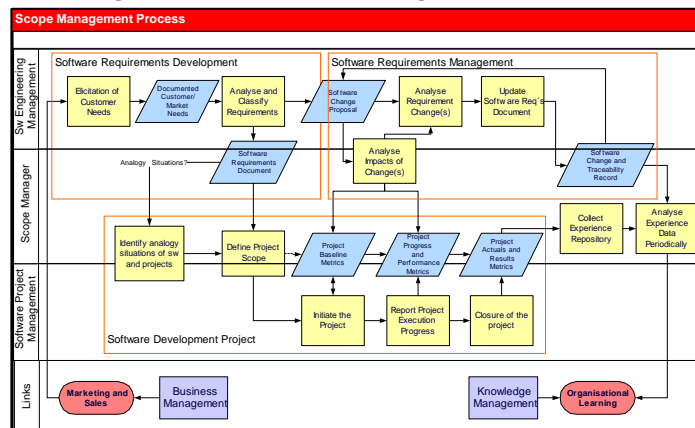
1. If the program consists of ICT development and other development work, such as manual process development, re-organising staff or technical development, different type of work should be assigned to separate projects.
2. If you apply incremental or iterative development approach, every increment or iteration should be assigned to separate projects.
3. Different type of ICT development work should be assigned to separate projects.
4. If the program must be stopped consciously for long time, for example to wait external decisions, the work before and after the break should be assigned to separate projects.
5. If two parts of product or service development are similar ICT project type but differ from each other by development technology, they should be assigned to separate projects.
6. If two parts of product or service development are similar ICT project type but differ from each other by development environment, they should be assigned to separate projects.
7. If two parts of product or service development are similar ICT project type but differ from each other by development team experience, they should be assigned to separate projects.
8. If two parts of product or service development are similar ICT project type but differ from each other by quality requirements of target result, they should be assigned to separate projects.
9. If two parts of product or service development are similar ICT project type but differ from each other by stakeholder dependencies, they should be assigned to separate projects.
10. If two parts of product or service development are similar ICT project type but differ from each other by risk level, they should be assigned to separate projects.

Estimation  
Benchmarking  
Quality management  
Process improvement

Carol Dekkers & Pekka Forselius, 4SUM Partners  
www.4sumpartners.com



## FiSMA scope management process components



Estimation  
Benchmarking  
Quality management  
Process improvement

Carol Dekkers & Pekka Forselius, 4SUM Partners  
www.4sumpartners.com



# New!

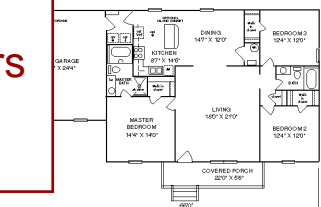
## Non-traditional ICT project tasks

- Division into independent sub-projects
- Functional size measurement
- Baselined project metrics
- Effort, duration, & cost estimates based on historic project actuals
- Feedback loop for change

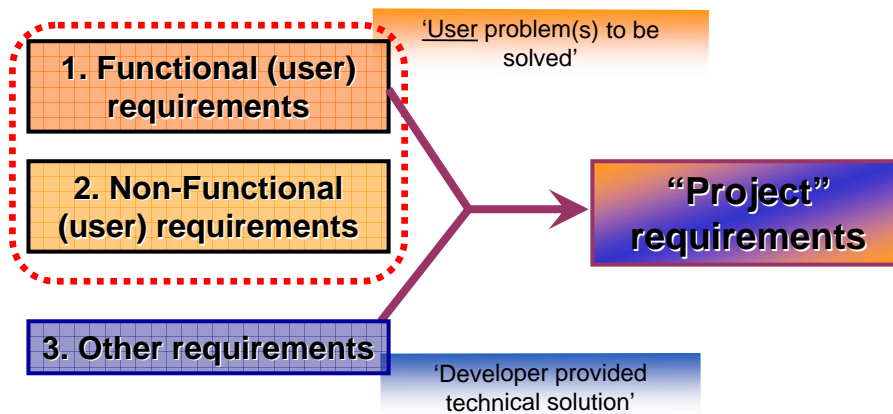
## Introduction to Functional Size Measurement (FSM)

**“Function Points are the  
square feet or square meters  
for software”**

*Carol Dekkers*



# Project requirements - simplified



Estimation  
Benchmarking  
Quality management  
Process improvement

Carol Dekkers & Pekka Forselius, 4SUM Partners  
www.4sumpartners.com



## 1. Functional user requirements

→ What the software must do:

- ☐ Business processes performed by / supported by the software (user problem to be solved by software)
- ☐ Examples: Record air temperature and pressure; Add new customer
- ☐ Important for estimating
- ☐ Like a floor plan for software: size is “Functional Size”

**Size = functional size (function points FP)**



Estimation  
Benchmarking  
Quality management  
Process improvement

Carol Dekkers & Pekka Forselius, 4SUM Partners  
www.4sumpartners.com



## 2. Non-functional user requirements

→ **HOW** software must perform -ilities: (Suitability, Quality, Interoperability, Security, Reliability, Efficiency, Maintainability, Portability...)

- ☐ Constrains the software → increases complexity
- ☐ Important for estimating
- ☐ Like a building code or contract specifications (part of user problem to be solved)

**Not part of functional size**



## 3. Other requirements

→ **How software will be developed / 'built'**

- ☐ Includes: tools, methods, skills, language, WBS tasks, platforms, software, type of project, etc.
- ☐ Part of solution
- ☐ Important for estimating
- ☐ Like "blueprint" drawings

**Not part of functional size**

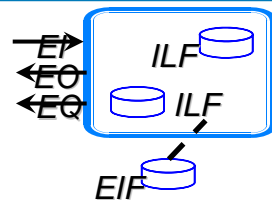


## Functional size measurement (e.g., Function Points)

- Quantifies “Base functional components (BFC)”
- Number of “points” based on standard methods
- Similar to sizing rooms in a floor plan

International Function Point Users Group (IFPUG) has 5 BFCs:

- Persistent data: ILF, EIF
- Elementary processes: EI, EO, EQ



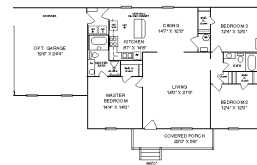
Estimation  
Benchmarking  
Quality management  
Process improvement

Carol Dekkers & Pekka Forselius, 4SUM Partners  
[www.4sumpartners.com](http://www.4sumpartners.com)



## Functional size measurement

- Five standard ISO/IEC conformant FSM methods:
  - IFPUG 4.1 unadjusted – ISO/IEC 20926
  - COSMIC – ISO/IEC 19761
  - NESMA – ISO/IEC 24570
  - Mark II – ISO/IEC 20968
  - FiSMA 1.1 - ISO/IEC 29881



Estimation  
Benchmarking  
Quality management  
Process improvement

Carol Dekkers & Pekka Forselius, 4SUM Partners  
[www.4sumpartners.com](http://www.4sumpartners.com)



## 4. Scope managers



## What is a scope manager

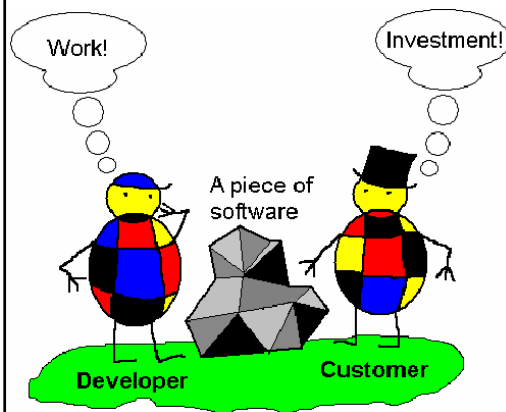
The Scope Manager provides **metrics based project governance**. ...very successful in objectively quantifying key project attributes ... to enable decision making with respect to project estimates and project risk...

**Typically a metrics specialist** who has excellent skills in business analysis, project estimation and functional size measurement.

...**Independent of the project team** ... able to report the status of the project objectively without bias, to a management level that has the authority to proceed, change direction or cancel the project.

*(Morris, 2004)*

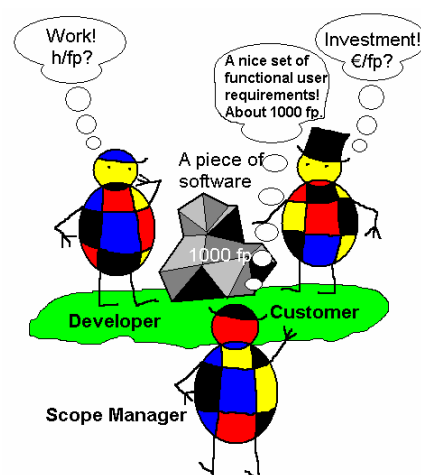
# Customer & supplier views



1. A big problem is that there are very few **customers** who understand the size of software, even if they are good at specifying requirements. **They want fixed price!**
2. Due to missing FSM skills, the **developers** cannot measure or estimate the size of software. **They want to be paid based on hours worked.**

# Scope manager – the Equaliser

- A Scope Manager is neutral software measurement specialist with good understanding of requirements and development work.
- The customer organisation can hire a professional Scope Manager to help from early tendering phase to the end of the development life-cycle.
- **The customer and developer can use unit pricing e.g. €/fp.**



## Scope manager's tasks in theory

1. Help customer to organise the development program into measurable subsystems and projects.
2. Measure the size of each piece of software to be developed.
3. Help customer to answer the questions of candidate suppliers.
4. Baseline the size with the selected supplier.
5. Help customer to control changes and progress.
6. Ensure that the project data will be collected and submitted to a common repository.

Phases of Software Acquisition	Tasks of Scope Manager
<b>FEASIBILITY STUDY, initial requirements</b>	Defining requirements, setting the development program to projects, measuring the functional size and providing list of functions required
<b>INVITE PROPOSALS AND ENGAGE SUPPLIER</b>	Preparing answers to questions presented by the bidders, if they also are related to functional size
<b>REQUIREMENTS SPECIFICATION</b>	Comparing the lists of functional user requirements and measuring the baseline functional size of software
<b>SOFTWARE DEVELOPMENT</b>	
DESIGN	Controlling progress by function and by phase of SDLC (from Development Structure), measuring the delivered functional size monthly
IMPLEMENTATION	
SYSTEM TEST	Measuring the impact of proposed changes to functional and non-functional user requirements and maintaining the accepted baseline estimates
INSTALLATION	
<b>PROJECT CLOSURE</b>	Measuring the actual project delivery rates and productivity and collecting the project data to experience database(s)

FiSMA Scope Manager rule definition document 2005

Estimation  
Benchmarking  
Quality management  
Process improvement

Carol Dekkers & Pekka Forselius, 4SUM Partners  
www.4sumpartners.com



## Scope manager's tools in Finland

- **Characteristics analysis**  
A method and a simple MS Excel tool for analysing and pointing out the characteristics of a large software development program.
- **Experience® Pro 3.1**  
Packaged software supporting functional size measurement and determination of the quality requirements, as well as providing the related attachment reports for the contracts. The tool includes several project databases to check the reality and feasibility of the target projects.
- **MS Word**  
Used to provide a 1 page summary of the system size and quality requirements by sub-system.



Estimation  
Benchmarking  
Quality management  
Process improvement

Carol Dekkers & Pekka Forselius, 4SUM Partners  
www.4sumpartners.com





## 5. Making change happen

## Sustainable change needs **P.O.W.E.R.**

Predisposition → we see success

Outlook → we will do it

Wherewithal → we can do it

Evaluation → we will measure it

Resources → we commit to it

*Source: C.Dekkers 2000*



“ Motivation moves  
mountains...  
Motivation is  
everything! ”



*Principle 6 of Tom Gilb's Ten Most Powerful Principles for Quality in (Software and) Software Organizations, 2<sup>nd</sup> World Congress on Software Quality, Tokyo, September 2000*

Estimation  
Benchmarking  
Quality management  
Process improvement

Carol Dekkers & Pekka Forselius, 4SUM Partners  
[www.4sumpartners.com](http://www.4sumpartners.com)



## Critical success factors of SPI:

Pressure for change	Leadership and vision	Capable people	Actionable first steps	Effective rewards	Results
+	+	+	+	+	Successful implementation
	+	+	+	+	Disinterest
+	+	+	+		Evaporation
+	+	+		+	Frustration
+	+		+	+	Disengagement
+		+	+	+	Dissolution

Source: P. Willman

Estimation  
Benchmarking  
Quality management  
Process improvement

Carol Dekkers & Pekka Forselius, 4SUM Partners  
[www.4sumpartners.com](http://www.4sumpartners.com)



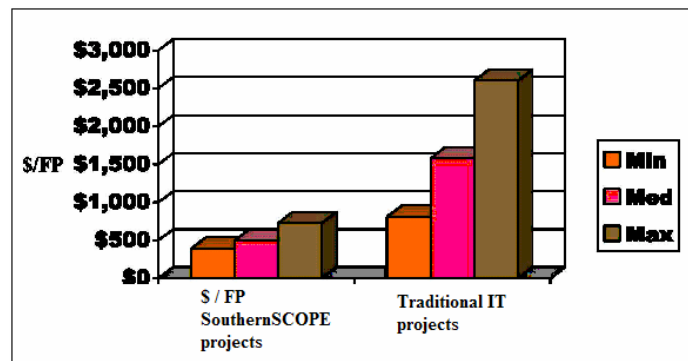
## 6. Summary

Estimation  
Benchmarking  
Quality management  
Process improvement

Carol Dekkers & Pekka Forselius, 4SUM Partners  
[www.4sumpartners.com](http://www.4sumpartners.com)



## Results speak for themselves



Estimation  
Benchmarking  
Quality management  
Process improvement

Carol Dekkers & Pekka Forselius, 4SUM Partners  
[www.4sumpartners.com](http://www.4sumpartners.com)



# Thank you !



**Carol Dekkers**

[dekkers@qualityplustech.com](mailto:dekkers@qualityplustech.com)



**Pekka Forselius**

[pekka.forselius@4sumpartners.com](mailto:pekka.forselius@4sumpartners.com)

Estimation  
Benchmarking  
Quality management  
Process improvement

Carol Dekkers & Pekka Forselius, 4SUM Partners  
[www.4sumpartners.com](http://www.4sumpartners.com)

